



## Acceleration

### Acceleration Test Description

Procedures for the acceleration tests were based on the Society of Automotive Engineers (SAE) Recommended Practice J1491\*, "Vehicle Acceleration Measurement." The following measurements were taken:

- Elapsed time from 0 to 60 mph at wide open throttle (WOT); ballast conditions at:
  - (a) unloaded vehicle weight (UVW) + 300 lb; and
  - (b) gross vehicle weight rating (GVWR)
- Elapsed time from 40 to 60 mph at WOT; ballast condition at UVW + 300 lb
- Elapsed time and maximum velocity for a quarter mile WOT acceleration from rest; ballast condition at UVW + 300 lb.

All ballast conditions include the driver and instrumentation.

### Acceleration Test Preparations

In addition to the tasks outlined in *General Test Preparations*, the following pre-test tasks were performed:

- The tires were measured to confirm that the treads had worn no more than 25%.
- The tire pressures were set to placard values.
- The throttle plates were confirmed to be wide open when the accelerator pedals were fully depressed.
- The air conditioning compressor clutches were deactivated.
- The rear axles' drum brakes were adjusted such that there was no drag when the brake pedals were released, and it was confirmed that there was no excessive drag at the front axles' disc brakes.
- Fifth wheel instrumentation was installed for the measurement of elapsed time and speed.
- The vehicles were weighted to the appropriate ballast conditions.
- Vehicle specification and checklist sheets based on SAE J1491 forms were



[View larger image](#)

completed.

## **Acceleration Test Procedure**

The acceleration tests were conducted on TRC's 7.5-mile oval multi-lane concrete roadway with a consistent grade of 0.2% through the 2-mile straight sections.

Immediately prior to testing, the tire pressures were re-checked and adjusted if necessary. Also, the vehicles were weighed with the driver, instrumentation, and ballast in place, and final weight adjustments were made. Test weights were recorded.

Testing began by driving the vehicles at approximately 55 mph for at least 20 miles on the 7.5-mile oval to bring the drivetrain and tires up to normal operating temperatures. Immediately after completing the warm-up procedure, the series of acceleration tests began. Warm-up drives were completed before every acceleration test session.

Six runs were made for each measurement until three in each direction were completed. If one run was compromised, both it and its paired run in the opposite direction were excluded and an additional pair of runs was made. During the course of testing, the variability of each six-run set was calculated and it was confirmed that the data met the variability requirements of SAE J1491. Weather conditions for the test period were recorded.

Reported test results represent the average of the six measurements.

The vehicles were operated with the windows closed, the climate control fan switched to its lowest speed, the parking lights on, and all other electrical equipment switched off.

\* Society of Automotive Engineers Surface Vehicle Standard, J1491, "Vehicle Acceleration Measurement," Issued 1985-06, Reaffirmed 1995-03.

[\[HOME\]](#) [\[TOP OF PAGE\]](#)